TFE EXPANSION BEARING ASSEMBLIES (10-12-01)

1.0 DESCRIPTION

A TFE expansion bearing assemblies consists of a TFE bearing pad, a stainless steel sheet, a sole plate, a steel plate with pintles, a masonry plate, any necessary fill plates, a bearing pad, an anchor bolt assembly which includes anchor bolts, nuts, washers, and pipe sleeves, a closure plate, grout, various sizes of standard pipe, and any other necessary material as detailed on the plans. These bearing assemblies are located at the expansion ends of applicable spans as shown on the plans.

2.0 MATERIALS

A. As indicated on the plans, a 3/32 " (2 mm) thick pad meeting the requirements listed hereinafter is required to be factory bonded to the steel bearing plate.

1. Use a pad of 100% virgin polytetraflouroethylene resin material, blended with milled glass fibers or other approved filler material.

2. Use TFE resin that is 100% virgin polytetraflouroethylene meeting the requirements of ASTM D4894 or D4895, with a specific gravity between 2.13 - 2.19 and a melting point of 623°F ± 2 (328°C ± 1).

3. Use filler material of milled glass fibers or other approved inert materials.

4. Use a filled TFE pad conforming to the following physical and mechanical properties over a temperature range from -360°F to 500°F (-218°C to 260°C).

Specific Gravity ASTM D792	2.17 – 2.23
Tensile Strength (min.) ASTM D4894 or D4895	2,000 psi (13,800 kPa)
Tensile Elongation (min.) ASTM D4894 or D4895	200%
Compressive Strength (Cross Direction) @ 0.2% yield strength (min.) ASTM D695	1,150 psi (7,930 kPa)
Hardness (Shore Durometer “D” Scale @ 78°F (25°C)) ASTM D2240	58 - 68
Wear Factor K	$11 \times 10^{-10} \frac{(in^3 - min.)}{(lb - ft - hr.)}$ [$1.33 \times 10^{-5} \frac{(mm^3 \cdot min)}{(N \cdot m \cdot hr)}$]

Select a qualified, established bearing manufacturer to bond the TFE pad to the steel bearing plate under controlled conditions.

Prior to bonding, clean and etch the bonding surface of the TFE pad by the sodium naphthalene or sodium ammonia process. Blast clean the bonding surface of the back-up steel plate to provide an adequate anchor profile for bonding. Bond the TFE pad with a high temperature epoxy in accordance with the written instructions provided by the adhesive manufacturer. Bond the TFE pads so that after completion of the bonding operation, the TFE surface is smooth and free from bubbles. Polish the sliding surfaces of the TFE sheet smooth.

B. Provide a minimum 11 gage or 1/8 " (3 mm) thick stainless steel sheet. If the maximum plan dimension of the stainless steel sheet is 12 " (300 mm) or less, then a 16 gage or 1/16 " (1.6 mm) thick sheet is permitted. Use a sheet in conformance with ASTM A167/A264 Type 304 and polished to a minimum #8 mirror surface finish.

Blast clean the surface of the plate to be attached to the stainless sheet to a near white condition in accordance with the Standard Specifications. Position and clamp the stainless steel sheet on the steel plate. Apply the stainless steel sheet to the blast cleaned surface of the steel plate as soon as possible after blasting and before any visible oxidation of the blast cleaned surface occurs. Weld the stainless sheet continuously around its perimeter using a tungsten inert gas, wire-fed welder.

C. Galvanize all bearing plates except those receiving the TFE pad or stainless steel sheet. Commercially blast clean the plates receiving the TFE pad or stainless steel sheet and, except for the areas where the TFE pad or stainless steel sheet attach, paint them with two coats of organic zinc repair paint in accordance with the Standard Specifications. Repair painted surfaces that are abraded or damaged at any time after the application of the zinc coating as specified for damaged galvanizing. Provide anchor bolts and nuts that are in accordance with the Standard Specifications. Cut the pipe sleeve from Schedule 40 PVC pipe meeting the requirement of ASTM D1785.

3.0 TESTING

A. General

The manufacturer is required to furnish facilities for testing representative samples of a completed bearing or provide for an independent test facility.

B. Test Specimens

Provide test samples to test for the coefficient of friction, adequacy of bond or other defects. Have the manufacturer furnish certified laboratory test results on these tests as well as certified laboratory test results on all material, physical and mechanical properties used in the construction of the bearings.

C. Test Method

1. Arrange the Test to determine the coefficient of friction on the first movement of the test sample.

2. Clean the bearing surface prior to testing.

3. Conduct the test at a stress of 2,000 psi (13,800 kPa) for the TFE surface with the test load applied continuously for 12 hours prior to measuring friction.

4. Determine the first movement static and dynamic coefficient of friction of the test sample at a sliding speed of less than 1 in/min (25 mm/min) and make sure that it does not exceed a coefficient of friction of 0.09.

5. Subject the bearing specimen to 100 movements of at least 1 inch (25 mm) of a relative movement at a speed of less than 1 ft/min (300 mm/min). Following this test, determine the static and kinetic coefficient of friction again. The specimen is considered a failure if it exceeds the value measured in (4) above or if it shows any sign of bond failure or other defects.

4.0 BASIS OF PAYMENT

Payment for the bearing assemblies will be at the contract lump sum price bid for "TFE Expansion Bearing Assemblies". Such lump sum price will be full compensation for all materials, tools, galvanizing, equipment, labor and incidentals necessary to furnish and install the TFE bearing assemblies.

The lump sum price bid for "Structural Steel" will be full compensation for the Fixed Bearing Assemblies as shown on plans.